

200309104-1

10/620,860

REMARKS

This is a full and timely response to the final Official Action mailed December 20, 2005. Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

No amendments are proposed by the present paper. Thus, claims 1-42 are currently pending for further action.

Prior Art:

The outstanding Office Action maintained the rejection of claims 1-26, 37 and 39-42 as anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 6,346,986 to Kieronski ("Kieronski"). Claims 1-42 were also rejected as being unpatentable under 35 U.S.C. § 103(a) over the teachings of Kieronski taken alone. For at least the following reasons, these rejections are respectfully traversed.

Claim 1 recites:

A method for producing a three-dimensional object through solid freeform fabrication comprising:

selectively depositing containment material to form a boundary structure, wherein said boundary structure defines a surface of said object; and
depositing a flowable build material within said boundary structure, wherein said flowable build material forms a portion of said object by flowing to said boundary structure.

(emphasis added).

Independent claim 7 similarly recites:

A method for producing an object through solid freeform fabrication comprising:

selectively depositing containment material to form a boundary structure with a high precision dispenser; and

200309104-1

10/620,860

depositing a flowable object build material into said boundary structure with a low precision dispenser.
(emphasis added).

Independent claim 27 similarly recites:

A method of producing an object through solid freeform fabrication comprising:
selectively depositing containment material to form a plurality of perimeter structures defining an outer surface of said object with a high precision dispenser; and dispensing a volume of fluid build material interior to said perimeter structures.
(emphasis added).

Independent claim 39 similarly recites:

A method of creating a three-dimensional object with a liquid build material comprising:
selectively depositing containment material to form a structural boundary, wherein said structural boundary defines a surface of said three-dimensional object; dispensing a liquid build material into said structural boundary; and solidifying said liquid build material.
(emphasis added).

In contrast, Kieronski fails to teach or suggest selectively depositing containment material to form a boundary structure or structural boundary. As described in Applicant's specification, "selective deposition methods include using a dispensing mechanism to deposit, at particular locations, individual drops of material known as voxels." (Applicant's specification, paragraph 0002). The system taught by Kieronski does not include selectively depositing containment material as defined and claimed by the Applicant.¹ Rather, the method of Kieronski operates on entirely different principles.

Kieronski teaches using stereolithography to form a part that is essentially a mold "having opposing interior surfaces. An uncured strength material is interposed between the

¹ The meaning of words used in the claims is determined by the meaning given to those words in the specification. *Markman v. Westview Instruments*, 116 S. Ct. 1384 (1996); *McGill, Inc. v. John Zink Co.*, 736 F.2d 666, 674 (Fed. Cir. 1984); *ZMI Corp. v. Cardiac Resuscitator Corp.* 884 F.2d 1576, 1580, 6 U.S.P.Q.2d 1557, 1560-61 (Fed. Cir. 1988) ("words must be used in the same way in both the claims and the specification.").

200309104-1

10/620,860

opposing interior surfaces... . The strength material is chosen to bond to the opposing interior surfaces during the heating step.” (Kieronski, abstract). Thus, the mold of Kieronski is formed using stereolithography. As is well known to those of skill in the art, stereolithography does not involved “selectively depositing” material. Rather, in stereolithography, a moveable platform is placed in a bath of liquid plastic. A laser is used to selectively solidify a portion of the surface of the liquid plastic on the platform.² The platform is then lowered further into the bath so that the solidified portion is submerged just below the surface of the liquid. The laser then again solidifies a portion of the surface of the liquid plastic. This process repeats until a desired object is formed on the platform.³ The process *does not* include the selective deposition of material as does Applicant’s claimed method.

The recent Office Action argues that “stereolithography ... is deemed to meet the recitation of ‘selectively depositing.’” (Action of 12/20/05, p. 4). This is simply incorrect and an unreasonable construction of “selectively depositing.” As defined by Applicant, “selective deposition methods include using a dispensing mechanism to deposit, at particular locations, individual drops of material known as voxels.” (Applicant’s specification, paragraph 0002). Consequently, stereolithography simply does not involve “selectively depositing containment material to form a boundary structure,” as recited in claims 1, 7 and 39.

² Stereolithography is a “three-dimensional printing process that makes a solid object from a computer image by using a computer-controlled laser to draw the shape of the object onto the surface of liquid plastic.” (<http://dictionary.reference.com>).

³ See, <http://computer.howstuffworks.com/stereolith.htm>

200309104-1

10/620,860

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claims 1, 7 and 39 and their respective dependent claims under § 102 based on Kieronski should be reconsidered and withdrawn.

With regard to the § 103 rejection based on Kieronski, as demonstrated above, Kieronski fails to teach or suggest the claimed method that includes "selectively depositing containment material." In fact, Kieronski teaches away from selectively depositing containment material by teaching an entirely different process, stereolithography, for the formation of a mold.⁴

Moreover, there is no motivation in the prior art to modify Kieronski so as to include the claimed method step of selectively depositing containment material. Any such modification would be an outright change in the operating principles taught by Kieronski. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)." M.P.E.P. § 2143.01.

No prior art has been cited that teaches or suggests the selective deposition of containment material to form a boundary structure as claimed. The conclusions reached in

⁴ A reference must be considered for all it teaches, including disclosures that teach away from the invention as well as disclosures that point toward the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.* 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985). A reference must be considered for all it teaches, including disclosures that teach away from the invention as well as disclosures that point toward the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.* 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985).

200309104-1

10/620,860

the Office Action can only be reached if one ignores the definition of "selectively depositing" which is both given in Applicant's specification and is clear in the art. If the proper definition of "selectively depositing containment material" is respected, it becomes clear that the prior art cited fails to teach or suggest Applicant's claimed subject matter.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). Consequently, the rejection under § 103(a) based on Kieronski should also be reconsidered and withdrawn.

Independent claim 37 recites:

A method of producing a porous object through solid freeform fabrication, said method comprising:
selectively depositing a first material with a high precision dispenser to form an outer boundary structure;
selectively depositing a smaller, internal boundary structure with said high precision dispenser; and
filling said outer boundary structure with a solidifiable build material, wherein said filling is performed by a low precision dispenser.

As demonstrated above, Kieronski fails to teach or suggest selectively depositing a first material to form an outer boundary structure. Kieronski further fails to teach or suggest selectively depositing a smaller, internal boundary structure with the same dispenser. For at least these reasons, the rejection of claim 37 and its dependent claims based on Kieronski should be reconsidered and withdrawn.

Claims 1-26 and 39-42 were also rejected as anticipated under 35 U.S.C. § 102(b) by DE 19537264 to Greul et al. ("Greul"). Alternatively, claims 27-38 were rejected as being

200309104-1

10/620,860

unpatentable under 35 U.S.C. § 103(a) over the teachings of Greul taken alone. For at least the following reasons, these rejections are respectfully traversed.

Like Kieronski, Greul does not teach or suggest "selectively depositing containment material to form a boundary structure, wherein said boundary structure defines a surface of said object." As shown in Figs. 2-3, Greul teaches using a form to build two halves of a mold. There is no "selective deposition" of material to form the mold. Then, as shown in Fig. 4, the mold is assembled and, in Figs. 5-7, the mold is filled to produce the desired object. Nowhere does Greul teach or suggest "selectively depositing containment material to form a boundary structure, wherein said boundary structure defines a surface of said object." Reference should be had to the definition of "selectively depositing" from Applicant's specification which was noted above.

Again, "[a] claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. And, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least these reasons, the rejections based on Greul should be reconsidered and withdrawn.

Additionally, various dependent claims in the application recite further subject matter that is not taught or suggested by the prior art of record. Specific examples follow.

Claim 8 recites "depositing a sparse array support structure to support said boundary structure." None of the cited prior art references teach or suggest depositing a sparse array

200309104-1

10/620,860

support structure to support a deposited boundary structure. The final Office Action fails to indicate how or where the prior art teaches this subject matter and thus fails to make out a *prima facie* case of unpatentability.

Claim 18 recites "wherein said removing said boundary structure comprises melting said boundary structure." None of the cited prior art references teach or suggest melting a boundary structure. The final Office Action fails to indicate how or where the prior art teaches this subject matter and thus fails to make out a *prima facie* case of unpatentability.

Claim 29 recites "dispensing a volume of fluid build material comprises adjusting said volume with a feedback control device." None of the cited prior art references teach or suggest a feedback control device as claimed. The final Office Action fails to indicate how or where the prior art teaches this subject matter and thus fails to make out a *prima facie* case of unpatentability.

For at least these reasons, the indicated and similar claims should be found patentable over the prior art of record.

200309104-1

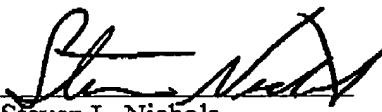
10/620,860

Conclusion:

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: February 9, 2006


Steven L. Nichols
Registration No. 40,326

Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Graner PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095
(801) 572-8066
(801) 572-7666 (fax)

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number **571-273-8300** on **February 9, 2006**. Number of Pages: **20**


Rebecca R. Schow